VS

FAX COVER SHEET

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Date: Nov. 21 2003 Time: 3:20pm

To: Uyen-Chau N. Le

Your Phone: (703) 303-306-5588

Your Fax: (703) 872-9306

From: Franz Ross

My Phone: (800) 367-0930

My Fax: (510) 841-2695

Re: Applications 09/895190

Total Pages: 28

Comment: Fax 1 of 2. - Amended Application 09/895,190

VoteSure llc

Applicant: William S. Rouverol
Art Unit: 2876
Tel. (703) 306-5588
Fax: (703) 872-9306
Serial Number: 09/895,190
Filed: July 2, 2001
For: VOTING DEVICE WITH IMMEDIATE FEEDBACK

November 21, 2003

Dear Ms. Le:

As per your request in our recent phone conversation, I am faxing back to you, using the fax number you gave me, the amendments to Patent Application No. 09/895,190.

Because there are a large number of pages, I will send this in two faxes. The first fax will have the clean version of the amended Application and Application Claims. The second fax will have a marked-up version of the original Application and Application Claims.

Please note that in Mr. Rouverol's enclosed cover letter he mentions that he submitted a petition to "Make Special (Applicant's Age)" back in December of 2001. Mr Rouverol is 85 years old. A copy of his request and supporting documentation is enclosed.

Although this request somehow got misplaced, Mr. Rouverol has requested the same "Make Special (Applicant's Age)" status for another Patent Application he currently has active with the PTO. The PTO has granted Mr. Rouverol this status as you can see from the enclosed PTO document.

Could you please change the status of this Patent Application (09/895,190) to "Make Special (Applicant's Age)" since the PTO has already granted Mr. Rouverol this status? You can use his enclosed December 3, 2001 letter to document this request or I will fax you a new request if you need it.

Sincerely Yours,

Franz Ross

Franz Ross
CEO VoteSure llc
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VoteSure *llc*

Applicant: William S. Rouverol
Art Unit: 2876
Serial Number: 09/895,190
Filed: July 2, 2001
For: VOTING DEVICE WITH IMMEDIATE FEEDBACK

November 21, 2003

Dear Ms. Le:

Enclosed are copies of clean versions and marked-up versions of pages of my original patent application SN 09/895,190 that have changes indicated in my amendments of July 27, 2003, and August 30, 2001.

I hope that these corrections will remedy the non-compliance notice of November 17, 2003 objections and that the subject application will now be considered as ready for allowance.

Please give these corrections your earliest attention, as we have already lost a large number of months of patent life. Since my letter of December 3, 2001 requesting special treatment because of the age of the applicant (84) was totally ignored, I am enclosing a copy of a notification from the PTO dated October 15, 2003 regarding a change of status to Special Handling because of the age of the applicant (now 85) and applicable to my co-pending patent application 10/438782. In the interest of consistency, I am suggesting that if an applicant has several co-pending patents being examined by the PTO, and one of those co-pending patents is granted Special Treatment acceleration because of the age of the applicant, they all should be.

Sincerely Yours,

William Rouverol

William Rouverol
Tel (510) 848-8121
encl. sheets, incl. p 1 ,3 ,5 ,6 ,7 ,10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, and 21.

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OCT 15 2003

DIRECTOR'S OFFICE
TECHNOLOGY CENTER 3600

William S. Rouverol
Apt. 201
1385 Shattuck Ave.
Berkeley CA 94709

In re application of : **DECISION ON PETITION**
William Spence Rouverol : **TO MAKE SPECIAL**
Application No. 10/438382 : **(APPLICANT'S AGE)**
Filed: May 16, 2003 :
For: GEARING WITH FUNCTION-SPECIFIC MODIFICATIONS

This is a decision on the petition submitted on September 22, 2003, under 37 CFR 1.102 (c) to make the above-identified application special under the accelerated examination procedure set forth in MPEP 708.02, Section IV, Applicant's Age.

The petition is **GRANTED**.

An application may be accorded special status upon the filing of a petition providing evidence showing that the applicant is at least 65 years old. Such a showing may be provided by evidence such as a birth certificate or a statement from the applicant.

The evidence submitted with the petition is a copy of applicant's passport showing that h is at least 65 years of age.

The examiner is directed (1) to make an interference search for possible interfering applications, (2) to promptly examine this application out of turn, and (3) if any interfering application is discovered, to examine such application simultaneously and state in the first official letter of such application that it is being taken out of turn because of a possible interference.

Petitioner is advised that this application will continue to be special, throughout its entire prosecution and pendency, including interference or appeal, if any, only if petitioner makes a prompt ***bona fide*** effort, in response to each Office action, to place the application in condition for allowance, even if it is necessary to conduct an interview with the examiner to accomplish this purpose.

SUMMARY: Petition to Make Special **GRANTED**.

Steven N. Meyers
Special Programs Examiner
Technology Center 3600
(703) 308-3868

SNM/ekn 10/7/03

1331 Arch Street
Berkeley, CA 94708

Dec. 3, 2001

Supervisor,
Group Art Unit 3724,
Patent aND Trademark Office,
Washington, D. C. 20231

Dear Sir,

I am writing to request "Special Handling" for my patent application Serial No.09/895,190, entitled "Voting Device with Immediate Feedback,"filed July 2, 2001. It is my understanding that the PTO gives this preferantial accelerated treatment to elderly applicants. I am now 84 years of age, as may be seen from the enclosed Xerox copy of page 2 of U.S. passport No. B2094037 (birth date Nov.23,1917). My birth certificate is also available if needed.

Please let me know if my application can be given this special status.

Very truly yours,

William S. Rouverol

William S. Rouverol

Encl.

WARNING: ALTERATION, ADDITION OR MUTILATION OF ENTRIES IS PROHIBITED. ANY UNOFFICIAL CHANGE WILL RENDER THIS PASSPORT INVALID.

NAME—NOM
WILLIAM SPENCE ROUVEROL

SEX—SEXE: M

BIRTHPLACE—LIEU DE NAISSANCE: MISSOURI, U.S.A.

BIRTH DATE—DATE DE NAISSANCE: NOV. 23, 1917

ISSUE DATE—DATE DE DELIVRANCE: JULY 24, 1981

WIFE/HUSBAND—EPOUSE/EPOUX: X X X

EXPIRES ON—ECHET LE: JULY 23, 1986

MINORS—ENFANTS MINEURS: X X X

William S. Rouverol
SIGNATURE OF BEARER—SIGNATURE DU TITULAIRE

IMPORTANT: THIS PASSPORT IS NOT VALID UNTIL SIGNED BY THE BEARER. PERSONS INCLUDED HEREIN MAY NOT USE THIS PASSPORT FOR TRAVEL UNLESS ACCOMPANIED BY THE BEARER.

Patent Application of

William S. Rouverol

VOTING DEVICE WITH ENHANCED FEEDBACK

Drawings, specifications, claims

Send Correspondence to:

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William S. Rouverol

1735 Martin Luther King Way

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William S. Rouverol

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Background of the Invention

1. Field of the invention:

This invention relates to devices for the manual registering of data on machine-processable record cards. More particularly it relates to punch-card voting devices.

2. Prior art:

The principal prior art resides in the basic patents concerning the "Votomatic" voting device, relative to which the invention discloses improvements intended to increase the accuracy of that voting system. The basic patents on the Votomatic are U. S. Patents Nos. 3,201,038 and 3,240,409. A U.S. patent referred to in the latter is No. 3,007,620.

VOTING DEVICE WITH ENHANCED FEEDBACK

Summary of the Invention

All data registering devices, including voting machines, are subject to error, either from human lapses or mechanical malfunction. The object of the present invention is to disclose a device that incorporates features that immediately alert the user to the fact that an error has occurred, before it is too late or too inconvenient for the user to correct it. In voting devices that operate on a machine-processable record-card, such as the Votomatic and the Poll Star, votes are counted photo-electrically by shining a light through holes punched in the ballot card. According to the present invention, the greatest certainty regarding what punched-outs represent a valid vote can be obtained only if the same principle is employed to inform the voter as to whether his punch-out is or is not in the intended position and is a complete punch out. To provide the voter with this verification, backlighting is introduced that directs a beam of light upward through each punch-out toward the voter's eye. To achieve the optimum results, which demands that the frequency of faulty ballots be less than about one percent, the special backlighting features employed are combined with mechanical improvements that minimize defective punch-outs.

Backlighting had previously been considered and rejected because it was in conflict with the disposal of the chads. As more and more chads were accumulated underneath the punching surface, they would blanket the light source, reducing or eventually eliminating the illumination and possibly even creating a fire hazard if the light was hot enough. The solution to this problem, which is a main feature of the invention, was to divide the illumination into two parts, one well to the right of the region

where punched out chads fall vertically by gravity, and one well to the left of the region. The two light sources are directed to throw their light at opposite angles toward the underside of the punch card, and this combined effect is a bright vertical beam that tells the voter he/she has (or has not) made a clear punch-out directly adjacent to the right (or wrong) candidate's name. Obtaining this feedback information enables the voter to make immediate correction on his/her original ballot or, for more serious errors, to obtain a fresh ballot card from the precinct attendant. Every form of errant card punched can be quickly identify with this punch-out backlighting. The only person who can make this correction without a breach of ballot secrecy is the voter, and he/she has full opportunity to make the necessary repair, regardless of whether it is a " dimpled " chad, a hanging chad, undervoting, overvoting, or a misplaced vote. Even the notorious " butterfly ballot " which has been shown to confuse and disqualify thousands of voters would not be a problem.

When the above-described voter-activated backlighting system for the exposure and correction of ballot errors is combined with some very advantageous improvements in mechanical features, punch-card voting should become more reliable and accurate than any electronic voting system currently available, including optical scanning and touch-screen, as well as costing only a fraction as much to install and operate. Hopefully the improvements disclosed will reduce the observed undervoting or defective voting on punch-card voting devices from its present 1 to 4% to perhaps as low as 1/3 to 1/4 %. This level of accuracy is better than that of any competing device and should make a manual recount seldom if ever needed. It is not inconceivable that the improvements described

herein can achieve what should be the goal of all voting machines: zero disenfranchisement.

Brief Description of the Drawings

FIG. 1 is a sectional view of a voting device embodying the invention. It is analogous to FIG. 2 U.S. Patent No. 3,240,409, which shows in FIG. 1 the position and direction of the sectional cut. The view indicates how a Votomatic could be modified to provide backlighting that illuminates the underside of the punch card.

FIG. 2 is a broken-out plan view indicating one method of introducing a limit switch that energizes the lighting circuit when the punch card is properly inserted.

FIG. 3 is a wiring diagram for the embodiment that uses a single electric light bulb.

FIG. 4 is a wiring diagram for the embodiment that specifies two electrical light bulbs in parallel.

FIG. 5 is an enlarged diagram showing how the stylus may bind up in the inner template hole.

FIG. 6 is then an enlarged diagram showing a modification to the stylus probe that prevents it from binding in the inner template apertures.

Description of the Preferred Embodiments

Because the invention consists of a set of improvements to the punch-card devices covered by the above-listed prior are patents, the descriptions below will concentrate insofar as possible on the new features introduced, showing only as much of the prior art structures as is needed to support the applicant's claims. A full explanation of how the Votomatic voting device operates is provided in U.S. Patent No. 3,240,409, so it will not be reiterated in this specification. The fact that assigned part numbers are the same as those assigned in that patent should not be construed to imply that the disclosed improvements are applicable only to the Votomatic. They are equally applicable to most other punch-card voting devices as well.

In detail and referring to the drawings, FIG. 1 is analogous to FIG. 2 in U.S. Patent No. 3,240,409. Comparing the two figures, it will be seen that the housing 1 has been made much deeper. This is to provide space for at least one electric lamp but preferably two light sources, consisting of an elongated light bulb 201 to the left of the punching die T-strips 13, and a mirror 202 to the right of those strips. Mirror 202 and the socket 212 for bulb 201 are supported on the brackets 213 and 214 fixed to the bottom part of housing 1. Bulb 201 shows there is a circle, since it is a sectional view. A plan view of it would show that its diameter is at most a third of its length, and preferably a fifth or less. The lengthwise dimension of bulb 201, which ideally is similar to the length of the columns of preperforated areas on the punch-card, is oriented parallel to the long direction of the base 2, and the same is true of mirror 202. A cylindrical or parabolic reflector 215 may be used to directly light bulb from bulb 201 for the mirror 202 and the underside of T-strips 13.

Both bulb 201 and mirror 202 are mounted below the plane occupied by punch card 5 when that card has been inserted into the device. Mirror 202 is tilted at an angle and has a width such that beams of light from bulb 201 are reflected directly from the lower edge of mirror 202 Tuesday left most T-strip 13, and from the upper edge of mirror 202 to the right most T-strip 13. This arrangement ensures that the left side of all the T-strips 13 is illuminated by bulb 201 and the right side by mirror 202, so that when any aperture is made in punch card 5, the combined illumination will send a strong beam of light upward to the eye of the voter. (For "right" read "left " and vice versa if bulb 201 is to the right and mirror 202 to the left of T-strips 13.)

Several other characteristics of FIG. 1 should be noted. The T strips have the same shape as the corresponding T strips 13 in U.S. Patent No. 3,240,409, but they are made of a different material. Instead of the opaque black rubber T-strips 13 used in the Votomatic and other prior art punch card devices, the T strips 13 shown in FIG. 1 are made of a resilient elastomer that is pervious to light (transparent or translucent), such as latex or clear urethane rubber. In addition, the supporting ribs 10 and the lower part of frame 30, which in the Votomatic are molded of opaque plastic, are in the present invention molded of a transparent plastic such as clear acrylic ("Lucite") or clear polystyrene. The combination of the pervious-to-light T-strips 13 and the transparent supporting ribs 10, which are an integral part of base 2, ensures that the maximum amount of light will reach the underside of punch card 5. This gives to the voter "instant verification" that he/she has produced a clear punch-out.

It will be evident, from comparing the structure disclosed in FIG. 1 to that of FIG. 2 of the Votomatic patent, that the depth of the sides of base 2 has been increased by

introducing a transparent protective sleeve 208. This is to ensure that the light sources (bulb 201 and mirror 202) are protected from the chads 62 that have been punched out of card 5. Sleeve 208 is rectangular and in a plan view and has a projected area that is the same as card 5. Its bottom end opens into a removable plastic collection box 209 that catches the falling chads 62.

In general, all of the desirable features of the Votomatic may be retained in voting devices having the improvements disclosed in this specification. This includes (a) making the housing in two parts, a top part and a bottom part, as shown in FIG. 1 and FIG. 2 of U.S. Patent No. 3,240,409 and (b) utilizing two templates, an outer template 28 having apertures 61 only at positions adjacent to ballot choices printed on the spaced-apart leaves 45, and an inner template 18 having apertures 63 only at positions that are in register with preperforated areas 62 on ballot card 5 when it is inserted into the device far enough to bear against a flange 22 cemented to the lower end of said inner template 18 (see FIG. 9 U.S.patent No. 3,240,409). As explained in the specifications of said patent, when said ballot card 5 is fully inserted, said inner template 18 is shifted into a position of register of the apertures 63, 61 of said inner and outer templates 18, 28 respectively, against the urging of a light spring 25 bearing against said flange 22 (per said FIG. 9).

Although the Votomatic is the best of all prior art punch-card voting devices, it shares with these prior art devices one important shortcoming that is responsible for about half of the 1% or so defective ballots commonly cast on that machine. A failure of the voter to insert the ballot card 5 far enough into the device to bring the template apertures 61, 63 into register causes the punching stylus 64 to strike the inner template 18 between adjacent apertures 63 so that it is prevented from reading the ballot card 5. To

remedy this particular shortcoming, the present invention proposes to put a switch that turns on the backlighting at a position such that the energizing of light sources 201 and 202 occurs only if the inner template 18 is at the point where apertures 61 and 63 are both in register with preperforated areas 62, that is to say, when the ballot card 5 is fully inserted. Since the voter is instructed not to vote until the backlighting is on, this serves as a dramatic reminder that the ballot card must be fully inserted.

One way to switch on the backlighting is shown in FIG. 2. This is a partial plan view of the bottom end of the inner template 18, made visible by a break-out of part of frame 30. Flange 22 projects downward from the lower end of the inner template 18 and carries a light metal leaf spring 203 in place of the coil spring 25 shown in FIG. 9 of U.S. Patent No. 3,240,409. At or adjacent to the central portion of leaf spring 203 or any convenient point on flange 22 or the bottom edge of the inner template 18, there is a limit switch 205 that is positioned to close at the exact point when the perforated areas 62 of card 5 and apertures 61 and 63 are all in register. Limit switch 205 is mounted on an L-shaped bracket 210 that is in turn mounted on the lower portion of housing 1. One lead of limit switch 205 is connected to bulb 201 and the other to the main power supply, as shown in FIGS. 3 and 4.

It will be seen from FIG. 3 that the power circuit for bulb 201 is a very simple one, consisting only of the bulb itself and limit switch 205 in series. The bottom part of housing 1 may be either metal or plastic, but if it is metal it should be connected to the ground wire of the power supply cord. Although it is possible to use a second bulb in parallel with bulb 201 (FIG. 4), this is less desirable than using one bulb and a mirror 202, as shown in FIG. 1, on the basis of first costs, heat generation, and average load

imposed on limit switch 205. Mirror 202 may of course be omitted, but this would cause the right hand columns of punch-outs to have less illumination then the left-hand columns.

FIG. 5 is a schematic drawing that illustrates the second main shortcoming of the Votomatic, which is just as serious as failing to insert the ballot card 5 fully. In FIG. 5, it will be seen that the stylus 64 is not held vertical to the face of the inner template 18, so that the stylus probe 65 is subject to what may be called "the dresser drawer effect" Because the apertures 63 in the inner template 18 are partially cylindrical, the sharp edge of the probe 65 can dig into the side wall of aperture 63, and bind the stylus 64 against further inward movement. If there is substantial tipping of the stylus 64, the digging in will occur high up in aperture 63 so no mark will be made on the ballot card 5, and no vote will have been cast. If the stylus 64 tipping is less extreme, the digging in will occur much closer to the bottom of the aperture 63, so that only the tip 71 of the stylus 66 will reach the card 5, to make a " dimple " on the preperforated area 62 but no dislodgement of this area will occur, and the mechanical card-reader will not record a vote. This opens the door to controversies as to what should count as a vote and what should not.

To reduce the frequency of such problems, a small change may be made to the stylus probe 65, as indicated in FIG. 6. The sharp corner of the stylus probe 65 is rounded sufficiently to prevent the "dresser drawer " effect. The particular amount of rounding depends on the clearance provided between the diameter of the cylindrical portion of the aperture 63 in template 18 and the diameter of the stylus probe 65. It is also important

that the rounded portions have as smooth a finish as the balance of probe 65, so that both can be completely free of machining ridges or grooves.

As is shown in FIG. 5 the Votomatic stylus 64 has a needle tip 71 protruding from the end of the probe 65. The function of this small protrusion is to spear the preperforated area 62 of card 5 so that it cannot slide laterally during the punching action and hang up on one end or one side, producing what is called a "hanging chad " instead of a clean punch-out. There is not much question that a hanging chad counts as a vote in a manual recount, but if such a chad happens to get folded back to reoccupy its original aperture in the main body of card 5, no light may be transmitted through the punch-out so no vote will be recorded. For this reason it is desirable to strip away any hanging chads present on the completed ballot. This can and should be done by the voter, with or without the aid of the backlighting. It is important to note that a stylus 64 on which the needle-like tip 71 has been broken or worn off will produce many more hanging chads than one on which the needle tip 71 is intact.

To minimize the percentage of improperly punched ballot cards 5 it is highly desirable to provide a suitably worded instruction sheet that is continuously visible to the voter. Ideally it should be mounted just above the voting device. This is decidedly preferable to having it printed on one side of the first or second ballot leaf 45. An example of such an instruction sheet would include the following text:

"TO MAKE SURE YOUR VOTES WILL BE COUNTED:

1. Before you vote: Glance at the left side of your voting device to be sure the green signal light is glowing. This means your ballot is far enough into the ballot slot so the oval holes fit over the two reds pins. This automatically turns on the backlight that illuminates your punch-outs. Do not attempt to vote if the green light is not glowing, as it will spoil your ballot. If you cannot get the green light to glow, ask a precinct attendant to help you.

2. While you are voting: During each punch make sure the stylus is as close to straight up and down as you can make it. If you try to punch with the stylus tilted, it may jamb and not penetrate the punch card. If you have punched completely and correctly, each punch-out will show up as a small brightly-lighted rectangle, 1/16" by 1/8", where a "chad" has been removed. If you don't see this bright spot of light, it means you have tilted the stylus too much and have produced either a non-vote or a dimpled chad, neither of which will be counted as a vote by the mechanical card reader. If your punch has produced some light but over an area smaller than the full chad rectangle, then you have produced a "hanging chad", which will often not be counted as a vote. In either case it is necessary to punch at least one more time where you punched before, until the spot of light reaches the full rectangular size of a correctly punched-out chad. (The closer to vertical the stylus is kept, the more effective these repeat punches will be.)

Overvotes: Before you remove your ballot from the slot, leaf through all its pages to ensure that you do not have more than one bright spot of light for any one office or proposition, as this will disqualify your entire ballot. (President and vice-president count as a single office.) The only exception to this rule is in the case of boards or committees for which the ballot clearly instructs you to vote for two, three, four, five, etc., as the case may be.

3. When you finish voting: Withdraw the ballot from its slot and inspect its back side to see if there is a "hanging chad" that has been folded over about its upper or lower edge. This kind of hanging chad cannot be removed by repeat stylus punches, so it must be plucked off by hand. Before it is removed, however, it is desirable to turn the card over and note the number of this defective punch. Check this number against the same number on the ballot leaves to see if it corresponds to one of your intended votes. If so, pluck off the chad and reinsert the card into the slot in your voting machine, to make sure you have no overrvote. If not, fold the top part of the card over the punched portion and turn it in to the precinct worker for deposit in the ballot box. But if you do have an unintended vote or an overvote, obtain a new ballot and start again."

In summary, it should be noted that the foregoing disclosures all have the same objective, namely the reduction of ballot errors currently been produce by the best presently available voting device, the Votomatic, from its average error rate of about 1% to 0.5% or less. A realistic goal may be as small as 0.2 or 0.3%. The shortcomings of the Votomatic (sensitivity to insufficient insertion of the ballot card 5 and tilting of the stylus 64) have both been addressed herein by 3 innovations, and it is the hope of the

applicant that this "fail-safe" approach will achieve the desired results of largely eliminating voting errors.

Both the above noted shortcomings are addressed by (1) more visible instructions, and (2), the disclosed system of backlighting, which affords the voter a unique "instant verification " of a clean punch-out. The third innovation is different for each of the two above-noted shortcomings. Insufficient card insertion is addressed by having the backlighting turn on by full insertion of the ballot card 5, and excessive tilting of the stylus 64 is offset by rounding the sharp corner of the stylus probe 65.

The following observations are believed to be relevant to the claims: (a) All punch-card voting devices are designed for a particular ballot card 5, because the horizontal spacing of the parallel columns of preperforated areas 62 must be the same for apertures 61 and 63,adjacent leaf 45 axes, and adjacent T-strip 13 slits 14, and ribs 10; similarly the vertical spacing of the parallel rows of the preperforated areas 62 must match the vertical spacing of apertures 61 and 63 and choices exhibited on the ballot leaves 45. Most punch card voting devices are designed for the same generally available ballot card 5, which has 12 columns and 26 rows of preperforated areas 62. Accordingly, the card 5 is not part of the claimed structure. (b.) Preferred lamps include a long and narrow incandescent bulb (type T10) or an even longer and narrower fluorescent bulb (e.g.,. F9 BX). The latter runs cooler and imposes only a fourth as much amperage on the limit switch 205. LEDs can also be used. (c) The description "pervious to light " includes both transparent and translucent. (d) If it is desired to reduce the number of banging chads, the preperforated areas 62 may be made circular. in which case the slits in the punching die should be two directional, as for example a + shape (e) In keeping with

industry usage, a preperforated area 62 is called a "chad" once it is fully or partially detached from the body of the ballot card 5. (f) For the purposes of the claims, a stylus is a light form of punch, appropriate for a punch-out that has been preperforated. (g) Any light source used should be offset from the region beneath the die, so that no chads will blanket it. (h) The term "lamp" or "electric light bulb" includes all types of bulbs, whether incandescent, fluorescent, LED, or any other form of electrically driven illumination. (i) Instead of the enclosed limit switch 205 shown in FIG. 2, two contacts on leaf spring 203 may be used. (j) The preferred feature for holding the ballot card 5 in place is the same one used by the Votomatic, which is a pair of red colored pins. (k) It will be obvious that if a spacer is inserted into the housing 1 of a Votomatic, it can be made deep enough to accommodate one or more light sources. (l) Although the device disclosed herein is called a "voting device," it may also be used for exams, surveys, etc. (m.) If desired, a blinker may be introduced into the lighting circuit. (n) The removal catch basket 209 provided to catch the falling chads should be either transparent or low enough not to interfere with light beams emitted by bulb 201 and directed toward the T-strips 13 or mirror 202. (o) Mechanical devices could be introduced to overcome the shortcomings of the Votomatic, but they would increase the cost of the disclosed device and increase its complexity. The latter is always a problem because complexity tends to produce errors. Examples of such mechanical means include a door that is closed to force a complete insertion of the ballot card 5 as shown in FIG. 11 of U.S. Patent No. 3,240,409. Another such device that could be introduced to keep the stylus 64 perpendicular to the ballot card would be a square-section telescoping arm pivotally mounted at one corner of the housing 1 and holding at its free end a vertically slidable stylus. It appears likely that the

complexity of such arrangements would produce more errors than will occur with the above-described tip-rounded stylus fastened to a bead. chain. (p) Another mechanical device that could be introduced is a sharpened sheet steel scraper mounted on the bottom of the ballot slot 4. The purpose of this would be to scrape off the back side of the ballot any hanging chad as the ballot is withdrawn from its slot. While it is desirable to get rid of all hanging chads, this is not the way to do it, as it deviates from the basic concept of the present invention, which is to alert the voter to any improper punch-out so he/she can take steps to make the necessary repair. Since the scraper would operate on the ballot after the voter has finished, the "instant verification " would be circumvented and any unexpected error produced by the scraper would go uncorrected. It is much better to have "hanging chads," on the rare occasions when they do occur, discovered and corrected by the voter, as proposed in the above-suggested instruction sheet text section "When you finish of voting." (q) The term "light source " means an electric lamp or at least one mirror or other reflective surface. (r) If a sole lamp or light bulb is positioned above the plane of the card (5), there must be at least one mirror or other image-reflecting surface below that plane. (s) If bulb 201 is an incandescent light, apertures should be provided in the top and bottom of housing 1 to increase the convection of air for cooling. (t.) On the same side of the housing 1 that houses lamp 201, a "ready-to-vote" signal light (preferably green) is mounted, to tell the voter that the backlighting is operative. This signal light is illuminated by diverting a small portion of the light produced by bulb 201 by a small mirror.

Claims

1. A punch-card device including a punch, a die having a flat area adapted to support a machine-processable record card while said card is being punched, and a light source mounted below the plane of said flat area in a position to direct light through an aperture made in said card by said punch and thence toward an eye of the user of said device.

2. A punch-card device according to claim 1 wherein said light source includes an electric light bulb and a mirror.

3. A punch-card device according to claim 1 wherein said light source includes two electric light bulbs.

4. A punch-card device according to claim 1 wherein said light source includes an electric light bulb, partially surrounded by a reflector.

5. A punch-card device according to claim 1 wherein said light source includes an electric light bulb having an overall length greater than three times said bulb's maximum diameter.

6. A punch-card device according to claim 1 wherein said light source is illuminated by an operation of a limit switch closed by the full insertion of said card into said device.

7. A punch-card device according to claim 1 wherein an upper surface of said die is made of a material that is pervious to light.

8. A punch-card device according to claim 1 wherein. an upper surface of said die is supported on ribs made of transparent material.

9. A punch-card device according to claim 1 wherein. at least one transparent pane is interposed between said light source and chads punched out of said card.

10. A punch-card device according to claim 1 wherein light from said light source is made visible to the user of said device, to indicate to said user that the light source is energized.

11. A punch-card device according to claim 1 wherein an open space is provided below said die, said space having at least as great a width and length as said die, and a depth at least as great as the height of said light source.

12. A punch-card device according to claim 1 wherein said punch is in the form of a stylus with (a) a handle and (b) a slender probe made of a durable material and having a diameter smaller than the minimum width of preperforated areas to be punch out of said card, the free end of said road probe being slightly rounded to prevent binding during the punching operation.

13. A punch-card device according to claim 1 wherein said light source includes one electric light bulb and one mirror spaced apart by more than the width of said die.

14. A punch-card device according to claim 1 wherein instructions to the user regarding a proper method for inserting said card and manipulating the punch are visible to said user during the punching operation.

15. A punch-card device according to claim 1 wherein said card has a plurality of preperforated areas.

16. A punch-card device according to claim 1 wherein said card has a plurality of preperforated areas arranged in a plurality of rows and a plurality of columns.

17. A punch-card device according to claim 1 whercin said card has a plurality of preperforated areas arranged in a plurality of rows and a plurality of columns, and said

device has a plurality of the leaves turnably mounted on co-planar parallel axes spaced apart by multiples of the distance between adjacent columns of said preperforated areas.

18. A punch-card device according to claim 1 wherein said card has a plurality of preperforated areas arranged in a plurality of rows and a plurality of columns, and said device has a plurality of leaves turnably mounted on co-planar parallel axes spaced apart by multiples of the distance between adjacent columns of said pre-perforated areas, said leaves each having an edge adjacent to a different column of said preperforated areas and exhibiting a plurality of legible choices each aligned with a different one of said rows.

19. A punch-card device according to claim 1 wherein said card has a plurality of preperforated areas arranged in a plurality of rows and a plurality of columns, and said device has a plurality. of leaves turnably mounted on co-planar parallel axes spaced apart by multiples of the distance between adjacent columns of said preperforated areas, said leaves each having an edge adjacent to a different column of said preperforated areas and exhibiting a plurality of legible choices each aligned with a different one of said rows, said device also having (a) an opaque outer template mounted immediately underneath the plane of said axes and having an aperture adjacent to each said choices, and (b) a transparent inner template immediately underneath said outer template and having an aperture in register with each preperforated area of said card when said card has been inserted into said device sufficiently to bear against a flange fixed to the lower end of said inner template.

20. A punch-card device according to claim 1 wherein said card has a plurality of preperforated areas arranged in a plurality of rows and a plurality of columns, and said device has a plurality of leaves turnably mounted on co-planar parallel axes spaced apart

by multiples of the distance between adjacent columns of said preperforated areas, said leaves each having an edge adjacent to a different column of said preperforated areas and exhibiting a plurality of legible choices each aligned with a different one of said rows, said device also having (a) an opaque outer template mounted immediately underneath the plane of said axis and having an aperture adjacent to each of said choices, and (b) a transparent inner template immediately underneath said outer template and having an aperture in register with each preperforated area of said card when said card has been inserting into said device sufficiently to bear against a flange fixed to the lower end of said inner template, said card shifting said inner template to a position of register of the apertures in said inner and said outer templates against the urging of a light spring bearing against said flange.

21. A punch-card device according to claim 1 wherein an upper surface of said die is made of a resilient material and has slits adapted to permit said punch to detach preperforated areas from said card and force them into the open space beneath said die.

22. A punch-card device according to claim 1 wherein said punch is in the form of a stylus with (a) a handle and (b) a slender probe made of a durable material and having a diameter smaller than minimum width of preperforated areas to be pushed out of said card, the free end of said probe being slightly rounded to prevent binding during the punching operation and having at the tip a short needle adapted to spear said preperforated areas of said card.

23. A punch-card device according to claim 1 wherein a rectangular open-top box is snapped to the underside of said device beneath said die, adapted to catch all chads punched out of said card.

24. A punch-card device according to claim 1 wherein a small portion of the illumination from said light source is made visible to the user of said device, to signal that said device is ready for voting.

VOTING DEVICE WITH ENHANCED FEEDBACK

Abstract of the Disclosure

All data registering devices, including the voting machines, are subject to error, either from human lapses or mechanical malfunction. The object of the present invention is to disclose a device that incorporates features that immediately alert the user to the fact that an error has occurred, before it is too late or two inconvenient for the user to correct it. In voting devices that produce a machine processable record card, such as the Votomatic and Poll Star, votes are counted photo-electrically by shining a light through holes punched in the ballot card. According to the present invention, the greatest certainty regarding what punch-outs represent a valid vote can be obtained only if the same principle is employed to inform the voter as to whether his punch-out is or is not in the intended position and is a complete punch-out. To provide the voter with this verification, backlighting is introduced that directs a beam of light upward through each punch-out toward the voter's eye. To achieve the optimum results, which demand that the frequency of faulty ballots be less than about one percent, the special backlighting features employed are combined with mechanical improvements that minimize defective punch-outs.